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KANSAS STATE AGRICULTURAL COLLEGE BULLETIN

VOL. II FEBRUARY 1, 1918 NO. 3

SUMMER SCHOOL

SPECIAL WAR SESSION

May 31 to August 2
1918

Education for Vocational and Social Efficiency

UNIVERSITY OF ILLINOIS
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MANHATTAN, KANSAS

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WHITE, A. E. Associate Professor Mathematics.
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Kansas State Agricultural College Summer School.

May 31 to August 2, 1918.

PURPOSE.

There is no larger or better equipped plant devoted to the teaching of agriculture, home economics, mechanic arts and related subjects than Kansas has in her State Agricultural College. In order that this plant may not remain idle during the summer months, the Board of Administration has authorized the organization of a Summer School. The College is authorized by an act of Congress to expend each year a portion of the national appropriation for "providing courses for the special preparation of instructors for teaching the elements of agriculture and mechanic arts."

Each year there is an increasing demand for trained teachers of agriculture, shop work, mathematics, the sciences and home economics. The College has not been able to supply this demand. The Summer School offers an opportunity for experienced teachers to prepare themselves to meet the new demand placed upon the public schools, viz.: Preparing the boys and girls for vocational and social efficiency.

ADVANTAGES AT KANSAS STATE AGRICULTURAL COLLEGE.

There is a growing conviction among the leading educators that the best institution in which to train teachers of vocational subjects is a well-equipped technical college, where the courses of study are pointed towards the producing vocations. The Kansas State Agricultural College is such an institution.

The College campus occupies a commanding and attractive site upon an elevation adjoining the western limits of the city of Manhattan, with electric car service into town and to the railway stations. The grounds are tastefully laid out according to the designs of a landscape architect, and are extensively planted with a great variety of beautiful and interesting trees, arranged in picturesque groups, masses and border plantings, varied by banks of shrubbery and interspersed with extensive lawns, gardens and experimental fields. Broad, macadamized and well-shaded avenues lead to all parts of the campus. Including the campus of 160 acres, the College owns 748 acres of land. Outside the campus proper, all the land is devoted to practical and experimental work in agriculture. Within the College grounds most of the space not occupied by buildings or needed for drives and ornamental planting is devoted to orchards, forest and fruit nurseries, vineyards, and gardens.

The College buildings, twenty-one in number, are harmoniously grouped, and are uniformly constructed of attractive white limestone ob-

tained from the College quarries. The College owns and operates its own system of waterworks, and is provided with a complete sewage system.

The library will be open during the summer and its valuable collection of books, periodicals, bulletins and reports will be placed at the service of the Summer School students.

EXPENSES.

Tuition is free. A matriculation or entrance fee of $5 and an incidental fee of $5 are charged all students whose homes are in Kansas. For nonresidents of the state a matriculation fee of $10 and an incidental fee of $10 are charged. Each student pays also a sick-benefit fee of $1. Receipts for these fees must be presented before enrollment in the Summer School classes. Table board varies from $3.50 to $5 a week. Three meals a day, except on Sunday, are served at the College cafeteria in Kedzie Hall. Room rent ranges from $6 to $12 per month. The College Young Men's Christian Association offers accommodation in its building for a limited number of men students at prices ranging from $10 to $12 a month. The cost of rooms is reduced by half where two students room together.

REGISTRATION AND LATE REGISTRATION.

Registration will take place in Nichols Gymnasium from eight until five o'clock on the opening day, Friday, May 31. No one will be allowed to register for full-time work after Friday, June 14. All class and laboratory work begins with the first period, Saturday, May 31.

COLLEGE CREDITS AND VISITING PRIVILEGES.

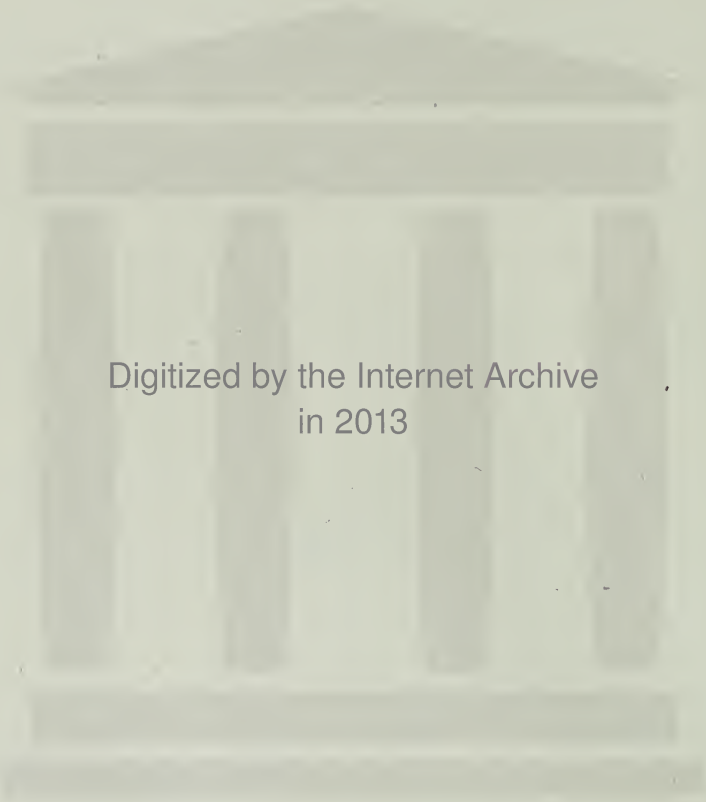
Full College credit will be given for all courses satisfactorily completed by regularly matriculated students unless otherwise specified in the announcement of courses. Students desiring College credit will not be allowed to carry more than ~~six~~ seven semester credit hours of work. Those interested primarily in freshening their acquaintance with subject matter, in enlarging their outlook, or in improving their methods of teaching, and not caring for credit toward a degree, may, upon showing a receipt for Summer School fees, be given a visitor's card, which will admit them to any courses offered. They should, however, make out class cards for any courses which they wish seriously to pursue. A limited visiting privilege may be granted to candidates for College credit by the Director in case such privilege be not likely to interfere with the quality of the College-credit work.

CONVOCATION AND COLLEGE LECTURES.

The hour from eleven to twelve daily except Monday is reserved for general assembly of all students and members of the faculty. At least once a week the program is musical or literary in nature, including numbers by the Summer School music staff, by visiting artists and by the Summer School chorus and orchestra. Every student with musical ability is urged to join one of the musical organizations. The remaining days of the week are devoted to lectures by visiting instructors and by teachers of the College.

RECREATION AND AMUSEMENT.

On Thursday evening of each week a special program for relaxation and enjoyment will be offered on the College campus. Last summer, out-of-door moving picture shows, "community sings" and folk games proved to be of general interest to students and townspeople alike. These programs will be continued and improved upon in the Summer School of 1918. The vicinity of Manhattan abounds in beautiful and easily accessible spots for "hikes" and picnics. Camp Funston is only forty minutes distant by trolley, and a trip to the Camp makes an enjoyable and instructive outing. For those who appreciate opportunities for literary and forensic improvement, combined with social good times, the Summer School Literary Society meets Saturday evening of each week and is open to all students.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COURSES IN THE SUMMER SCHOOL.

DIVISION OF AGRICULTURE.

W. M. JARDINE, Dean.

AGRONOMY.

Professor CALL.
Associate Professor THROCKMORTON.
Assistant Professor SEWELL.
Assistant Professor BONNETT.
Instructor ZAHNLEY.

101. GRAIN CROP PRODUCTION. Class work, four hours; laboratory, six hours. Three semester credits. Assistant Professor Bonnett.

This course is a study of the distribution, relative importance and production of grain crops, including wheat, corn, oats, barley, rye, rice, buckwheat and flax. Prerequisite: General Botany.

131. SOILS. Class work, six hours; laboratory, six hours. Four semester credits. Associate Professor Throckmorton.

This course comprises a study of the management of farm soils and deals with the origin of soils and their physical nature; the effect of different methods of cultivation upon the liberation of plant food; conservation of moisture, and physical conditions of the soils. Prerequisite: General Chemistry. Text, Lyon, Fippen and Buckman's Principles of Soil Management.

132. SOIL FERTILITY. Class work, four hours; laboratory, six hours. Three semester credits. Professor Call and Assistant Professor Sewell.

This course involves a study of the effect of different crops and different systems of farming upon the fertility of the soil; the use of barnyard manure, including proper methods of handling, preserving and applying it; and determinations of needs of soils for commercial fertilizer and lime. Prerequisite: Quantitative Analysis and Soils. Text, Hopkins' Soil Fertility.

ELEMENTARY AGRICULTURE. Class work, four hours; laboratory, six hours. Three semester credits. Instructor Zahnley.

This is a general course planned for teachers of public schools who teach one year of agriculture. It covers the entire field of general agriculture, together with suggested outlines for a year's work in the laboratory. Texts, Waters' Essentials of Agriculture, and Call and Schafer's Manual of Agriculture.

ANIMAL HUSBANDRY.

Professor COCHEL.
Assistant Professor VESTAL.
Assistant Professor PATERSON.

ANIMAL HUSBANDRY I. Class work, two hours; laboratory, twelve hours. Four semester credits. Assistant Professor Paterson.

This course consists of a study of the market and breeding types and classes of horses, cattle, sheep, and swine. The purpose of this course is to give to the student a knowledge of animals which will be in feed lots and on breeding farms.

ANIMAL HUSBANDRY IV. PRINCIPLES OF FEEDING. Class work, six hours. Three semester credits. Assistant Professor Vestal.

This course involves a study of the digestive system and the processes of nutrition, and of the theory of practical economy of rations, both for the maintenance and for the fattening of all classes of farm animals. Prerequisite: Elementary Organic Chemistry.

DAIRY HUSBANDRY.

Professor REED.
Instructor DAVIS.

101. ELEMENTS OF DAIRYING. Class work, four hours; laboratory, six hours. Three semester credits. Professor Reed and Instructor Davis.

This is a general course in dairying, dealing with the secretion, composition and properties of milk; care of milk and cream on the farm, a study of the different methods of creaming, construction and operation of farm separators; principles and application of the Babcock test; use of the lactometer; and buttermaking on the farm. Lectures are supplemented by textbook work.

Laboratory. Practice in operating the Babcock test and lactometer; separation of milk; and farm buttermaking.

104. DAIRY JUDGING. Laboratory work, six hours. One semester credit. Professor Reed.

Dairy stock is judged from the standpoint of economical production and breed type. Score cards are used to teach the student to become accurate, thorough and systematic in the selection of animals as representatives of breeds or for breeding purposes.

HORTICULTURE.

Professor DICKENS.
Professor AHEARN.

PLANT PROPAGATION. Class work, four hours; laboratory, six hours. Three semester credits. Professor Dickens.

A discussion of the natural and cultural methods of propagation; seeds, seed testing, and seed growing; treatment given to different classes of seeds; the production of seedlings for stock; grafting, budding, layering, making cuttings, and the special requirements necessary in propagating commercial fruits and ornamental plants. Lectures and assigned readings. Prerequisite: Plant Anatomy.

Laboratory. Practical work in preparation of seeds, seed testing, the preparation of seed beds, the use of seeding machinery, transplanting, grafting, budding, and general nursery practice.

LANDSCAPE GARDENING. Class work, four hours; laboratory, six hours. Three semester credits. Professor Ahearn.

Lectures are given on the principles of landscape art and the means of their application to the problems of improving lawns, yards, country homes, school grounds, and public parks. Opportunity is given the student to become acquainted with plant materials that are best adapted to Kansas conditions.

ORCHARDING. Class work, six hours. Three semester credits.

It is a discussion of the conditions necessary for success with orchards. Location, improvement of soil, application of fertilizers, pruning, prevention of loss from frost, marketing and storage. Prerequisites: Plant Propagation and Pomology II.

MARKET GARDENING. Class work, four hours; laboratory, six hours. Three semester credits. Professor Ahearn.

In this course a systematic study is made of both commercial and amateur gardening; soil improvement, the value of fertilizer, marketing and storage conditions are given special attention.

Laboratory. The laboratory work consists of the preparation of the plans for gardens; seed testing; the construction of the hotbed; the use of tools and machinery; and practical work in the garden.

PLANT MATERIALS. Class work, four hours; laboratory, six hours. Three semester credits. Professor Ahearn.

Lectures are given on various species adapted to Kansas conditions; their arrangement and adaptability to the ornamentation of home grounds and a study of their form, texture and flowering habits.

Laboratory. The laboratory work consists of field work where the student is given the opportunity to become thoroughly acquainted with the habits of growth of different species found in this vicinity.

POULTRY HUSBANDRY.

Professor LIPPINCOTT.
Assistant FOX.
Superintendent AMOS.

101. FARM POULTRY PRODUCTION. Class work, two hours; laboratory, six hours. Two semester credits. Professor Lippincott.

This course takes up the problems of poultry management on the general farm. The subjects of feeding, breeding, incubating, brooding, and preparing for market are studied.

105. PRACTICE IN INCUBATION. Three times a day, seven days a week, for a period of not less than four weeks, at hours outside the regular schedule. One to two semester credits. Mr. Amos.

This course consists of the care of an incubator by the student through the incubation period, testing the eggs, and bringing off the hatch. Careful records of fertility, cost of incubation and varying temperature, moisture and ventilation conditions are kept. For one credit, one successful hatch must be brought off in either a hot-air or hot-water incubator. For further credit, the other types must be operated. Students specializing in poultry husbandry must take three credits.

107. PRACTICE IN BROODING. Three times a day, seven days a week, for a period of not less than four weeks, at hours outside the regular schedule. One to three semester credits. Mr. Amos.

In this course each student handles a flock of chicks. He has the entire care of brooding and feeding them during the four most critical weeks. A report of fuel and feed, of gain in weight, and of mortality, is required. This course must be preceded or accompanied by Practice in Incubation. For one credit a group of at least fifty baby chicks must be successfully brooded for four weeks in any one of the several types of brooders. For further credits, broods must be handled successfully in two other types of brooders. Students specializing in poultry husbandry must take three credits.

110. POULTRY BREEDS AND TYPES. Class work, two hours; laboratory, six hours. Two semester credits. Assistant Fox.

In this course a historical study is made of the various breeds commonly found on Kansas farms. Particular attention is paid to tracing the evolution of the present breed types. The laboratory is given over largely to judging the different breeds and varieties, both by score cards and by comparison.

201. Market Poultry. Class work, two hours; laboratory, six to twelve hours. Two to three semester credits. Assistant Fox.

In this course the lectures cover the methods of handling market poultry alive and dressed. The laboratory work consists of practice work in caponizing, killing, bleeding, packing, cooling, grading poultry for market, and candling and grading eggs. Where twelve hours of laboratory is taken the student will also milkfeed three lots of chickens for a period of two weeks each.

Backyard Poultry Keeping. Class work, two hours. One semester credit. Professor Lippincott.

This is a course in the art of poultry keeping with particular reference to the problems confronting town and city dwellers. The subjects of housing, feeding, breeding, incubating, brooding and preparing poultry products for consumption are discussed.

VETERINARY MEDICINE.

Professor Dykstra.
Associate Professor Burt.

Physiology. Class work, six hours. Three semester credits. Associate Professor Burt.

The work in this subject consists of the study of the skeletal tissues, the circulatory, digestive, respiratory and other systems, in much the same manner as is done during the regular college course. The lectures are supplemented with demonstrations and experiments. Dissected specimens are used as often as possible instead of papier-mâché models. The laboratory is well equipped with physiological apparatus. This apparatus is freely employed and its application explained. The demonstrations and experiments are especially helpful to those engaged in teaching and those intending to teach this subject. Credit in this course is the same as the credit in Human Physiology. It may be substituted for Animal Physiology. Text, Martin's Human Body. References are also made to Howell's Text Book on Human Physiology and others. Teachers are recommended to use the text by Howell.

167. Farm Animals in Health and Disease. Class work, six hours. Three semester credits. Professor Dykstra.

In this course the common diseases of domesticated animals are discussed, and particular attention is devoted to first-aid treatment, preventive measures against the spread of contagious and infectious diseases, methods of taking temperatures, counting the pulse and respirations, modes of administering drugs, bandaging, etc. Various aids to correct diagnoses, particularly tuberculin testing of dairy and beef animals, are taken up. A few lectures on the more commonly used medicines are included. When clinical cases are available, they are used to visualize the instruction given in the class room. This is a course for teachers and students of agriculture and for those engaged in agricultural pursuits.

DIVISION OF ENGINEERING.

A. A. Potter, Dean.

APPLIED MECHANICS AND MECHANICAL DRAWING.

Assistant Professor Wendt.
Assistant Professor Pearce.

98, 99. Mechanical Drawing for High Schools. Lectures and recitations, two hours; drafting, eight hours. Three semester credits in the School of Agriculture.

A course intended for high-school teachers of mechanical drawing and for those desiring to make College entrance credits. The work of the course will be varied to suit the previous training of those who register for it. A study is made of drawing instruments and materials, drawing-room practice and conventions, lettering, orthographic projection, and simple working drawings. Practice is also given in tracing and blue-printing. Text, Crawshaw and Phillip's Mechanical Drawing for Secondary Schools.

160, 165. Mechanical Drawing I. Lectures and recitations, two hours; drafting, six hours. Two semester credits. Prerequisite: Descriptive Geometry (Arch. 104, 107). Assistant Professor Pearce.

The course includes the use and care of drawing instruments, with simple exercises in making working drawings from given plates. Special attention is given to the arrangement of views to secure balance, and to the subject matter and layout of titles and notes. The following supplies are required: Triangles, T-square, scale, pencils, pens, ink, eraser, thumb tacks, drawing paper, and a set of drawing instruments. Students are advised not to purchase these until after consulting with the instructor. Text, French's Engineering Drawing.

170. Mechanical Drawing II. Drafting, sixteen hours. Three semester credits. Assistant Professor Pearce.

Free-hand sketches are made from simple machine parts, followed by complete working drawings from these sketches without further reference to the objects. This is followed by the design of cams, gears and quick returns to fulfill specified conditions. Center-line drawings are first made, embodying the solution of the problems, and upon these are built working drawings of the machine parts. An effort is made to follow standard practice in the design of those details usually determined by empirical methods. Velocity diagrams are drawn for the cams and quick returns. Gear teeth are accurately rolled and are drawn from templates prepared by the student. Special emphasis is laid upon the proper selection of views to present the necessary information in convenient form, and to the dimensioning of the drawings. Text, French's Engineering Drawing.

180. Kinematics. Lectures and recitations, six hours. Three semester credits. Prerequisites, if taken for credit: Plane Trigonometry, Descriptive Geometry. Persons not taking the work for credit may be assigned to it without these prerequisites, by permission from the head of the department. Assistant Professor Pearce.

An analysis of the motions and forms of the parts of machines constitutes this course. Among the subjects discussed are: bearings, screws, worm and wheel, rolling cylinders, cones, and other surfaces; belts, cord and chains, levers, cams and linkwork, with the velocity and motion diagrams; quick returns, straight-line motions, and other special forms of linkages; wheels in trains; curves for gear teeth. The solution of a large number of graphical and mathematical problems is required in this course. Text, Schwamb and Merrill's Elements of Mechanism.

101. Applied Mechanics I Recitation. Class work, six hours. Three semester credits. Prerequisites: Calculus I and Engineering Physics II. Assistant Professor Wendt.

This course includes composition, resolution and conditions of equilibrium of concurrent and nonconcurrent forces; center of gravity; laws of rectilinear and curvilinear motion of material points; moments of inertia; relations between forces acting on rigid bodies and the resulting motion; work energy and power; graphical solutions of problems in statics. Text, Riggs' Hancock's Applied Mechanics for Engineers.

115. Applied Mechanics E-II Recitation. Class work, six hours. Three semester credits. Prerequisite: Applied Mechanics I. Assistant Professor Wendt.

Behavior of materials subjected to tension, compression and shear; riveted joints; torsion; shafts, and the transmission of power; strength and stiffness of simple beams; design of beams of wood, steel and reinforced concrete; stresses in columns and hooks; and the design of columns of wood, steel and reinforced concrete. Text, Boyd's Strength of Materials. Cambria Steel is used for reference.

145. Concrete Construction. Laboratory, six hours. One semester credit. Assistant Professor Wendt.

Instruction is given in the principles governing the selection and preparation of materials, the proper proportioning of materials for concrete, the construction of forms, mixing and handling concrete, finishing concrete surfaces, and the waterproofing of concrete. Text, Seaton's Concrete Construction for Rural Communities.

97. Military Surveying and Topography. Lectures and recitations, one hour; field work, three hours. One semester credit. Assistant Professor Wendt.

In this course training will be given in the use of the transit, level, plane table, aneroid barometer, and stadia work. The purpose is to teach rapid method of sketching topography and to have the students acquire speed and accuracy in representing same.

MANUAL TRAINING AND SHOP PRACTICE.

Professor Carlson.
Instructor Parker.
Assistant Bundy.

Manual Training Methods and Organization. Class work, four hours. Professor Carlson.

In this course a study is made of the development of manual training in the United States and abroad. The various kinds of work are considered and their suitability for the different classes of students, as well as the equipment and material required to carry on the work, together with their cost and where they can be secured; also a study of the factors affecting the arrangement and proper installation of equipment.

Manual Training for Primary Grades. Laboratory, twelve hours. Two semester credits. Mr. Parker.

The work of this course is planned to meet the need of teachers of primary work. Exercises suitable for the pupils of the various grades are made by the class and a brief study is made of suitable materials and equipment. The work includes paper folding and cutting, cardboard construction, raffia, cord work, weaving, reed work, and elementary tool work in woodworking.

Manual Training for Grammar Grades. Laboratory, twelve hours. Two semester credits. Mr. Parker.

This is a course in elementary woodworking planned primarily for the teacher of the upper grades. The work consists of simple, useful

problems which brings into use the common woodworking tools. Various woods are used so as to acquaint the student with different kinds of lumber. The finishing consists of staining, filling, and waxing. Considerable emphasis is laid upon the use and care of tools.

MANUAL TRAINING FOR HIGH SCHOOLS. Laboratory, twelve hours. Two semester credits. Professor Carlson and Mr. Parker.

This is a continuation of grade woodwork, the work being of such a nature as to require previous experience with tools. The early part of the course consists of useful problems in elementary furniture construction, a brief study of common woods and methods of finishing them, including staining, filling, waxing, varnishing and rubbing. During the latter part of the course the various woodworking machines are discussed, demonstrated, and instructions given in using them, after which enough work is given to enable the student to operate the woodworking machines.

ADVANCED WOODWORKING. Laboratory, twelve hours. Two semester credits. Professor Carlson and Mr. Parker.

This is a course in advanced cabinet construction, with the use of woodworking machinery and such bench work as is necessary for the assembling and finishing of the problems being constructed. A study is made of the progressive steps or operations in order that a proper use may be made of time. Instruction is given in the use and care of woodworking machinery and in staining, filling, varnishing, rubbing and finishing the problems constructed.

WOOD TURNING. Laboratory, twelve hours. Two semester credits. Professor Carlson.

This course is designed to prepare teachers for teaching wood turning in high schools. The work includes typical application of tools and processes, in turning between centers, on faceplates, and by means of hollow chucks. Exercises are given in turning cylinders, cones, beads, convex and concave surfaces, after which articles are made from drawings which have a practical application in a student's home or social life, such as handles, mallets, rolling pins, circular boxes with covers, Indian clubs, dumb-bells, napkin rings, bowls, towel rings typical vase forms, cups, goblets, frames, ornamental stools, etc. While many of these articles are made from blue prints, it is the aim to have the student make some object of value from his own design, both as a project in turning and as a practical lesson in designing.

FORGING I. Laboratory, six hours. One semester credit. Mr. Bundy.

In this course the field of hand-forging as related to high-school work is covered. The work includes practical exercises in making articles of use, which involve the operations of drawing, upsetting, welding, twisting, splitting and shaping. Sufficient instruction is given in the forging of tool steel to enable the worker to forge, harden and temper many of the tools which are needed in this and other branches of manual training.

Tools required: One pair five-inch outside calipers, one two-foot rule, one ball-peen hammer, weight about two pounds, including handle.

FORGING II. Laboratory, six hours. One semester credit. Mr. Bundy.

Advance work is given in the forging of iron and in the manufacture of tools, such as punches, chisels, drills, scrapers and hammers. Instruction is given in the proper methods of heating, forging, hardening, tempering, annealing and working the various kinds of tool steel and in the casehardening of mild steel.

Tools required: Same as in Forging I.

FORGING III. Laboratory, six hours. One semester credit. Mr. Bundy.

Special work is given in the forging of iron and steel to impart skill in the different operations. Some practice is given in the making of ornamental iron work.

Tools required: Same as in Forging I.

MACHINE TOOL WORK I. Laboratory, twelve hours. Two semester credits. Professor Carlson and Mr. Bundy.

This course includes both bench and machine tool work, in which practice is given in chipping, filing, shaper and planer work, scraping, drilling, cutting, right- and left-hand and multiple threads, and knurling on the lathe. Practically all of the work is upon parts of machines that are being built in the shops.

Tools required: A four-inch scale, or B. & S. slide caliper rule, one pair five-inch outside calipers, one pair five-inch inside calipers, one center drill, one B. & S. center gage.

MACHINE TOOL WORK II. Laboratory, six hours. One semester credit. Professor Carlson and Mr. Bundy.

This course consists of progressive problems in turning and calipering, boring, reaming and taper turning and threading on the lathe, exercises in chucking, the use of forming tools, practice on the key-seating machine, and the making of a spur gear on the milling machine.

Tools required: Same as in Machine Tool Work I.

MACHINE TOOL WORK III. Laboratory, six hours. One semester credit. Professor Carlson and Mr. Bundy.

This course takes up work on the turret lathe and boring mill; lacings, and methods of belt connections, compound and differential indexing, and the cutting of spiral gears on the milling machine.

Tools required: Same as in Machine Tool Work I.

THE MANUFACTURE OF MUNITIONS. Laboratory, supplemented by lectures, six hours. One semester credit. Professor Carlson.

A course dealing with the construction and methods of machining the various types of shells used in the U. S. and abroad. A study is also made of the gages, jigs, fixtures, etc., used to insure the work coming within the specified limits.

This course would be most suitable for men who have had Machine Tool Work I or its equivalent, though it can be successfully taken by others who are sufficiently interested or who expect to enter the service.

EMERGENCY MACHINE REPAIRS. Laboratory, supplemented by lectures, six hours. One semester credit. Professor Carlson.

A course dealing with the methods used in making emergency repairs to various types of machinery. It will include babbitting, scraping and aligning bearings, belt lacings, soldering, brazing, oxy-acetylene welding, riveting, and general repairs to machinery on the road and in the shop.

FARM ENGINEERING.

Instructor SANDERS.

FARM MOTORS I. Lectures and recitations, four hours; laboratory practice, six hours. Three semester credits.

This course is designed to teach the operation, care and repair of stationary gas engines, oil engines and steam engines. Some time is also devoted to automobile details, including automobile motors, carburetors, transmission systems, differentials, clutches and starting systems.

TRUCKS AND TRACTORS. Lectures and recitations, four hours; laboratory practice, six hours. Three semester credits.

A study is made of the selection, care and repair of traction engines.

GAS ENGINES AND TRACTION ENGINES. Lectures and recitations, two hours; laboratory practice, six hours. Two credits in the School of Agriculture; no college credit.

Gas engines and gas traction engines are studied as to their construction, operation and care.

DIVISION OF HOME ECONOMICS.

DEAN VAN ZILE.

DOMESTIC ART.

Professor BIRDSALL.
Instructor FECHT.
Instructor JONES.

CLOTHING I. Laboratory, twelve hours. Two semester credits. Professor Birdsall and Miss Fecht.

This course includes practice in hand and machine sewing; the making of simple articles, repairing garments, drafting by straight-line system, cutting and making undergarments and shirt waist. Appropriate materials and trimmings are discussed. A study of textile fibers, hygiene and the economics of clothing is made. Notebook work is an important part of the course.

MILLINERY. Laboratory, twelve hours. Two semester credits. Prerequisite: Clothing I or its equivalent. Professor Birdsall.

This course includes a dicussion of practical and artistic principles of millinery; preparation of various materials for trimming; practice in making bows, rosettes, and other forms of hat decoration; making wire and buckram frames; use of velvet, silk and straw; renovating and the use of old materials.

TEXTILES. Class work, four hours. Laboratory, six hours. Three semester credits. Prerequisite: Organic Chemistry. Miss Fecht.

This course considers the textile industry from primitive ages to modern times. The original purpose of the industry, that of furnishing covering for the body, and the later variations from this exclusive purpose, are treated, together with their effect on the composition and design of fabrics. The combination of art, science and mechanics that makes possible the elaborateness of modern textiles is given careful attention.

RED CROSS SURGICAL DRESSINGS. Class to qualify for teacher's certificate. Two hours. Professor Birdsall.

This course includes the making of dressings that are most needed in the hospitals in our own training camps and also in France.

HOSPITAL GARMENTS. Elective. Laboratory, twelve hours. Two semester credits. Professor Birdsall.

This course takes up the making of garments used in the hospitals, such as bed shirts, operating gowns, and pajamas.

DOMESTIC SCIENCE.

Instructor SKINNER.
Instructor GREEN.

FOODS II and III. Class work, six hours; laboratory, twelve hours. Five semester credits. Miss Skinner.

This is a combination course given to meet the needs arising from the change in the course of study. This course will include a study of typical proteins, process of milling, the use of leavening agents, and flours, together with intensive work in food preparation.

FOODS III. Class work, four hours; laboratory, six hours. Three semester credits. Miss Green.

This course is a continuation of Foods I and II. Doughs and bread mixtures, together with the preservation of food, are the subjects studied.

HOUSEKEEPER'S COOKERY. Laboratory, eighteen hours. Three semester credits. Given especially for those who are taking food work for the first time; of especial interest to those interested in conservation of food. Miss ———.

Stoves, stove construction, stove management and fuels are the first topics considered, and this discussion is followed by experiments illustrating the effect of heat upon starch and proteins. The necessary elementary principles involved are then applied to the cooking of cereals, vegetables, beverages, breads, meats, soups, simple cake mixtures, and puddings, and to the canning and preserving of fruits and vegetables. Special attention is given to the planning and serving of meals.

INSTITUTIONAL MANAGEMENT I. Class work, two hours; laboratory, twelve hours. Three semester credits. Prerequisite: Dietetics. Miss ———.

This course is a study of the food problem of institutions, and includes the study of the preparation, marketing and cost of service.

Laboratory. The preparation of food for institutional use and practical experience in the cafeteria of the department are included in the laboratory work.

HOME ART.

Assistant Professor HOLMAN.

DESIGN. Class work, two hours; studio work, twelve hours. Three semester credits. Assistant Professor Holman.

A study is made of the principles which control the use of color and the selection and arrangement of elements in the production of objects themselves and in their uses as parts of a whole. Many exercises are given in which clothing and home furnishings are scored as to design. A natural motif is adapted to material, function and form.

PUBLIC SCHOOL DRAWING. Studio work, twelve hours. Two semester credits. Assistant Professor Holman.

This course presents representation, color, design, construction work and picture study for rural and grade schools.

DIVISION OF GENERAL SCIENCE.

R. R. PRICE, Acting Dean.

PHYSICAL EDUCATION.

COURSES FOR MEN.

Courses for men are designed primarily to instruct men who desire expert practical knowledge of the best methods of coaching football, base ball, basket ball, and track and field athletics. These courses should appeal strongly to men who plan to take up coaching as well as men already engaged in coaching in high schools and colleges.

These courses will be conducted by lectures and by practical demonstrations.

Throughout all the courses, lectures and demonstrations will be given on the care and prevention of injuries, how to guard against injuries, how to care for them, and the best methods of bandaging sprains and weak joints.

FOOTBALL. Lectures and recitations, —— hours; field and demonstration work, —— hours. Professor Clevenger.

This course will cover the following phases: spirit of the game, discussion of the rules, tackling the dummy, charging sled, defense in general, line defense, secondary defense, kick-off, punting, place kicking, drop kicking, direct pass plays, systems of offense in general, quarterback pass plays, interference, signals, training, and equipment.

BASKET BALL. Lectures and recitations, —— hours; floor and demonstration work, —— hours. Professor Clevenger.

The work will cover the discussion of the rules, technique of basket shooting, foul throwing, catching and passing, dribbling, reverse turn, different styles of play, offense, defense, team work, selection of players, training and equipment.

BASE BALL. Lectures and recitations, —— hours; field and demonstration work, —— hours. Professor Clevenger.

The course will cover the discussion of the rules, fielding, batting, bunting, base running, sliding, team work, pitching, catching, proper way to play each position, indoor and outdoor practice methods, coaching, signals, training and equipment.

TRACK AND FIELD SPORTS. Lectures and recitations, —— hours; field and demonstration work, —— hours. Professor Clevenger.

This course will cover the discussion of the rules, starting, sprinting, distance running, hurdling, jumping, vaulting, shot putting, discus throwing, javelin throwing, training, dieting, and equipment.

COURSES FOR WOMEN.

GYMNASTICS. Lectures and recitations, one and one-half hours; practical work, three hours. One semester credit. Instructor Loring.

This course is especially planned for the needs of the teacher in the public schools where no special teacher in this subject is employed. Lectures are given on the general theory of gymnastics and the physiological reason for each exercise. A notebook is required.

Practical Work. The practical work includes free exercises, hand apparatus, heavy apparatus, and practice teaching.

FOLK DANCING. Lectures and recitations, one hour; practical work, four hours. One semester credit. Instructor Loring.

Lectures are given on the physiological benefit derived from the dances, in costuming, and in the use of the dances in festivals and fetes. A notebook is required.

Practical Work. This course offers graded folk dances of the different nations, suitable for use in schoolrooms, playgrounds, or gymnasiums.

GAMES. Lectures and recitations, one hour; practical work, four hours. One semester credit. Instructor Loring.

Lectures are given on the problems of grading games, and on the physiological benefits received. A notebook is required.

Practical Work. This course offers practice in games for grammar schools, high schools, playgrounds and gymnasiums.

ESTHETIC DANCING. Practical work, three hours. One-half semester credit. Instructor Loring.

Practical Work. This is a class for beginners. Technique and simple esthetic dances are taught. No exercise gives better training in muscle control, poise, and good carriage than does esthetic dancing.

TECHNIQUE OF BASKET BALL, BASE BALL, AND HOCKEY. Lectures and recitations, two hours. Two-thirds semester credit. Instructor Loring.

This course is devoted to the technique of these sports, the physiological benefit derived, and the organization of each into interclass contests.

SWIMMING. Five hours. No credit. Instructor Loring.

BACTERIOLOGY.

Professor BUSHNELL.

101. GENERAL BACTERIOLOGY. Class work, four hours; laboratory, six hours. Three semester credits.

The course is designed primarily for teachers, but students in General Science, Agriculture and Architecture may obtain credit in this course by special arrangement with the head of the department.

This course consists of a general survey of the subject of bacteriology as related to agriculture, sanitation, the preparation and care of food, etc. Some attention is also given to the method of isolation, cultivation and study of microörganisms. The student becomes somewhat familiar with methods used in the bacteriological analysis of water, milk, etc.; sterilization, sources and modes of infection by pathogenic bacteria, and means of controlling their distribution.

HOUSEHOLD BACTERIOLOGY. Class work, six hours; laboratory, twelve hours. Five semester credits.

This course is especially arranged for students taking domestic science. The credit received in this course is equivalent to that given for the regular college course. Students wishing to take this course should consult the head of the department before entering. See general catalogue for description of work offered, course 121.

SANITARY BACTERIOLOGY. Class work, four hours; laboratory, six hours. Three semester credits. No prerequisite required. This is a special course designed for persons desiring to fit themselves for war work.

As a knowledge of the principles of bacteriology, sanitation and hygiene is essential for those entering the sanitary or hospital service of the army or the Red Cross, and for those engaged in food and dairy inspection, the Department of Bacteriology is making this course particularly attractive for persons desiring such training.

The lectures treat of conditions necessary for the best growth of bacteria; methods of controlling their growth; sources and modes of infection by disease-producing bacteria; bodily defenses and immunity; bacteriology of water, milk, and other foods in their relation to sanitation and disease; disposal of sewage; disinfection; etc.

The laboratory work consists of a study of the making and sterilization of culture media, isolation and study of disease-producing bacteria; laboratory examination of water, milk, etc., according to standard methods; the use of the microscope and bacteriological apparatus; studies on sterilization and disinfection; and other work pertaining to this subject.

BOTANY.

Instructor PETERSON.
Instructor HAYMAKER.

ECONOMIC PLANT DISEASES. Class work, two hours; field and laboratory work, eight hours (two four-hour periods). Three semester credits. Instructor Haymaker.

The diseases affecting the chief economic crops of the field, orchard and garden are studied. Among these are the smuts of cereal and forage crops; the common rusts attacking wheat, oats, rye and barley; the apple blotch, apple scab, Illinois blister canker, brown rot of fruits; potato,

tomato and bean diseases, together with many others. Methods for preventing losses brought about by plant diseases will receive considerable attention. This course is intended to make high-school teachers familiar with the common plant diseases which are causing a great annual loss in Kansas. Time will be devoted to collecting and identifying these diseases in the field. Methods of collecting, preserving and preparing plant diseases for exhibit purposes, especially for high-school work, will receive attention. Text, Diseases of Economic Plants, Stevens and Hall.

FIELD BOTANY. Class work, two hours; field and laboratory work, eight hours (two four-hour periods). Three semester credits. Instructor Peterson.

The purpose of the course is to offer teachers an opportunity to become acquainted with plants in the field, their natural history, habits, distribution and relation to their environment. Excursions will be made to different localities near Manhattan, to study plants of the prairies, woods, swamps, streams, etc. Especial attention will be given to methods of collecting and preserving plants for use in high-school teaching. Part of the laboratory work will consist of determining the names of plants by means of manuals.

BOTANY FOR HIGH-SCHOOL TEACHERS. Class work, two hours; laboratory work, eight hours. Three semester credits for entrance or in the School of Agriculture. Instructor Peterson.

The purpose of this course is to give high-school teachers a method of teaching botany that will bring the subject into closer relation to the farm and its problems. It is an attempt to render possible the study of botany in a scientific sense, but by the use, so far as practicable, of strictly economic plants for laboratory material. Considerable emphasis is laid on the study of plants from the natural-history standpoint. Most of the larger and more important groups of plants are studied from this point of view. Text, Bergen and Caldwell's Practical Botany.

CHEMISTRY.

Assistant Professor HUGHES.
Assistant Professor BRUBAKER.
Instructor HAMMOND.

103. CHEMISTRY HE-I. Lectures and recitations, six hours; laboratory, twelve hours. Five semester credits. Assistant Professor Brubaker.

This work begins the study of general chemistry, and is designed, with that of chemistry HE-II, to give the student a knowledge of the fundamental principles of chemistry. As all subsequent progress in this science requires a working knowledge of its principal theoretical conceptions, the principles of nomenclature, the significance of formulas, chemical equations, etc., much attention is given to these, while at the same time, both in class and laboratory, special emphasis is placed upon those facts of everyday life in and about the home which possess special value to young women. Textbook: Inorganic Chemistry for Colleges, by Newell.

Laboratory. As far as time permits, the student performs independently experiments touching the preparation and properties of the more important substances. Preference is given to those operations which illustrate important principles, and the student is required, as far as possible, to study experiments in that light. The laboratory guide is A Laboratory Manual for General Chemistry, by McPherson and Henderson. It is accompanied by mimeographed material on special subjects.

104. CHEMISTRY HE-II. Lectures and recitations, six hours; laboratory twelve hours. Five semester credits. Prerequisite: Chemistry HE-I. Doctor Hammond.

The work in this course for the first half of the term is a completion of the study of general chemistry begun the preceding term. The second half of the term is devoted to the study of the general principles of qualitative analysis as outlined in an Elementary Treatise on Qualitative Analysis, by William McPherson.

Laboratory. In the laboratory the student studies the ordinary methods of separation and detection of the more common metals, nonmetals, acids, bases and salts. The teaching of analysis as such is a secondary object, although the student is held to the exact observation and careful reasoning required in ascertaining the composition of simple substances and mixtures. The effect of the course is to broaden, strengthen and unify the students' ideas of general chemistry.

121. ORGANIC CHEMISTRY HE. Lectures and recitations, six hours; laboratory, twelve hours. Five semester credits. Prerequisite: A college course in general chemistry. Assistant Professor Hughes.

A systematic study is made of the simpler examples of the more important classes of organic compounds in their logical chemical relations. Such substances as touch the everyday affairs of life are treated in greater detail. Opportunity is thus afforded to consider the hydrocarbons, alcohols, organic acids, fats, soaps, sugars, starch, proteins, and other less-known substances. Compounds used for clothing, fuel, light, antiseptics, disinfectants, anesthetics, poisons, medicines, solvents, etc., are included. Text, Norris's Organic Chemistry.

Laboratory. The laboratory work includes preparations and qualitative and quantitative experiments touching the more important compounds studied in the lectures and recitations. Especial emphasis is placed on the organic compounds found in fuels, foods, fabrics, disinfectants, and other materials used in and about the home. Laboratory guide, Experiments in Descriptive Organic Chemistry, by Alice F. Blood.

130. HUMAN NUTRITION. Lectures and recitations, six hours. Three semester credits. Prerequisites: Acceptable courses in human physiology and organic chemistry. Assistant Professor Hughes.

This is a course in the chemistry of foods and nutrition, and includes, among others, the following topics: The composition of the body; the composition of foods, and methods of investigation employed in their study; the changes that the several classes of foods undergo in cooking and digestion, and the functions which they perform in nutrition; daily food requirements, and the balancing of dietaries; food economy. Chemistry of Food and Nutrition, by H. C. Sherman, is used as textbook, but is supplemented by lectures.

265. HOUSEHOLD CHEMISTRY. Lectures and recitations, two hours; laboratory, twelve hours. Three semester credits. Assistant Professor Brubaker.

This course is designed to give the women in the course in Home Economics qualitative and quantitative work in the chemistry of the materials most intimately related to their daily life. Air, water, foods, fuel, fabrics, disinfectants, metals, and other materials used in and about the home are the subjects of numerous experiments touching their properties, usefulness and defects.

ECONOMICS AND SOCIOLOGY.

Professor KAMMEYER.
Doctor MERRITT.

101. ECONOMICS. Class work, six hours per week. Three semester credits. Professor Kammeyer.

In this course the fundamentals of the science are presented. The economic development of society is traced through the several stages as a preparation and background for the study of economic theory and principles. The consumption and production of wealth, theories and systems of distribution, and the mechanism of exchange are the basic divisions of the subject. These will include a study of such topics as value, rent, wages, interest, profit, money, banking, organization of industry, labor unions, and others that relate to man's wealth-getting and wealth-using activities. To this will be added, as time permits, a consideration of such related subjects as taxation, transportation, socialism, insurance, etc. Instruction by lectures, assigned readings, reports, and class discussions. Text, Ely's Outlines of Economics.

102. AGRICULTURAL ECONOMICS. Class work, six hours. Three semester credits. Doctor Merritt.

A study of the business of agriculture for the purpose of familiarizing the student with the economic principles and forces with which every farmer has to deal. The fundamental principles of production, distribution, and consumption are taken up with especial reference to agriculture. This course is to acquaint the student with the laws of supply and demand, and the influences determining them. The development of the growing complexity of the economic problems as the transition is made from self-sufficing general farming to localized commercial agriculture are shown. The subjects of ownership and tenancy, labor supply, labor-saving machinery, marketing farm products, coöperation, farmers' organization, prices, credit facilities, rural credit laws, economic improvement of farm life, taxation, transportation, etc., will be discussed. This course will be given with special reference to the conditions existing in this state. Instruction by lectures, assigned readings, and recitations. Text, Taylor's Agricultural Economics.

201. PRINCIPLES OF SOCIOLOGY. Class work, six hours per week. Three semester credits. Professor Kammeyer.

This is a study of the social and political units of organization, and questions of population, such as immigration, urban and rural population, and problems of city life; marriage and divorce, education and employment in their relation to family life; wealth accumulation and institutional means for the promotion of social well-being; remedial measures, legislative or voluntary, for the solution of social and economic problems. Instruction by lectures, assigned readings, reports, and class discussions. Text, Blackmar and Gillin's Sociology.

207. LABOR PROBLEMS. Class work, two hours. One semester credit. Doctor Merritt.

This course begins with a historical review of the rise of the labor class; then the historical development of labor unions will be briefly treated and extended attention will be given to their organization, aims, methods of offense and defense. Studies of the trade agreement, of strikes, the boycott, the lockout, methods of conciliation and arbitration, the application of the injunction in labor disputes, the political activity of labor organizations, employers' liability, legislation, workingmen's insurance, health insurance, profit sharing and coöperation in relation to labor problems, child labor, woman's labor, the minimum wage, the standard day, poverty and unemployment, immigration, the relation of labor and capital, will be made from the viewpoint of present conditions.

Instructions by lectures, assigned readings and recitations. Text, Groat's Organized Labor in America.

210. MONEY AND BANKING. Two hours per week. One semester credit. Professor Kammeyer.

This course embraces a study of money, its history, and characteristics as a measure of value and medium of exchange; and of credit currency, its nature, forms, and limitations. The course also includes a study of the principal banking systems of the world, their machinery and methods; branch banks, clearing houses, the mechanism of foreign and domestic exchange, etc. Special attention will be given to the federal reserve act and the federal farm loan act, as to their purpose, provisions, and operation. Instruction by lectures, class discussions and reports. Text, Holdsworth's Money and Banking.

225. RURAL SOCIOLOGY. Class work, six hours. Three semester credits. Doctor Merritt.

This course will deal with the problems of the rural family, the rural school, the rural church, rural societies and associations, the economic and social activities of the community, and the relation of the state to the general welfare. This will lead to the study of the reasons for the increased interest in rural sociology and rural problems; the effect of environment and occupations on community life; advantages and disadvantages of rural life; marketing and transportation as factors of community development; the various social institutions of the community, boys' and girls' clubs, men's clubs, the grange, and their possible economic and social activities; the rural church; the rural school; the country life movement, and the reorganization of rural and social forces. Interdependence of the town, city and rural life from the viewpoint of their economic and social relations and interests as a necessity for their mutual community development will be studied. The fundamental problems of rural life under conditions in this state will be analyzed. Instructions will be by lectures, assigned readings and recitations. Text, Voght's An Introduction to Rural Sociology.

EDUCATION.

Professor HOLTON.
Associate Professor ANDREWS.
Assistant Professor PETERSON.
Assistant Professor HALM.
Assistant Professor STRICKLAND.
Instructor ZAHNLEY.

101. PSYCHOLOGY. Six hours. Three semester credits. Assistant Professor Peterson.

A general introduction is here given to the forms and laws of conscious experience as based on a knowledge of the physiological conditions of mental life. The work of the course includes the study of a text, outside readings, lectures and class experiments.

105. EDUCATIONAL ADMINISTRATION. Six hours. Three semester credits. Associate Professor Andrews.

This course is a study of the organization of state, city and county schools; the interrelation of boards of education, superintendents, principals, teachers. The school law of Kansas is also studied.

109. EDUCATIONAL PSYCHOLOGY. Six hours. Three semester credits. Prerequisite: Psychology. Assistant Professor Peterson.

The course will deal with those aspects of psychology that have a direct bearing upon educational practices. Attention will be paid to the results of experimental investigations in the field. Lectures and library work.

METHODS OF TEACHING. Six hours. Three semester credits. Assistant Professor Strickland.

The aim of this course is the development of good classroom technique through detailed study of child experiences as related to the larger demands of education. The work includes lectures, library assignments, and observation of classes. A feature of the course is individual reports and discussions. Prerequisite: Psychology.

113. HISTORY OF EDUCATION. Six hours. Three semester credits. Associate Professor Andrews.

This course is intended to present the successive relationships that have existed between educational machinery and practices and the changing political, economic, scientific, cultural, and ideal environments from primitive times to the present.

121. HOME ECONOMICS EDUCATION. Four hours. Two semester credits. Assistant Professor Halm.

This course considers problems dealing with the place of Home Economics in modern secondary education; the aims and phases of work in various types of schools; the organization, maintenance, equipment and supervision of such departments. Prerequisite: Educational Administration.

125. AGRICULTURAL EDUCATION. Four hours. Two semester credits. Professor Holton.

A comparative study is made of the provisions for agricultural education in this and other states and countries and the principles underlying such education. The part played in agricultural education by community, county, state and nation is discussed. Types of schools, courses of study, adjustment of school work to community needs, and the equipment and administration of agricultural schools are studied. The aim of the course is to fit the student to plan, teach and administer or supervise agricultural work, especially in high schools.

131. SPECIAL METHODS IN THE TEACHING OF HOME ECONOMICS I. Four hours. Two semester credits. Assistant Professor Halm.

This course applies the principles of sound teaching to the selection and development of the subject matter of home economics in lessons for high-school pupils and to the conduct of laboratory and classroom exercises. It is supposed to accompany supervised observation and teaching.

SPECIAL METHODS II. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Methods I.

This course is a continuation of Methods I. Demonstration teaching of type studies in Home Economics is done in the laboratory. A review of technique is given in connection with laboratory practices. A small fee is charged to cover expense of materials. Recommended for inexperienced teachers.

INDUSTRIAL EDUCATION. Six hours. Three semester credits. Assistant Professor Strickland.

This course is a study of typical secondary schools of industrial education and departments of industrial education in public schools; of the industrial schools of Germany; of the making of a course of study in industrial education for elementary and secondary schools; of shop equipment and cost; of the pedagogy of vocational subjects. Prerequisite: Educational Administration.

SPECIAL METHODS IN AGRICULTURE. Six hours. Three semester credits. Mr. Zahnley.

Training in planning lessons, organizing materials, and conducting class and laboratory work in agriculture is the purpose of this course. The work will include observation, criticism and reports of class exer-

cises, a study of work done in high schools, and the making and criticism of lesson plans and outlines. Special attention is given to selecting laboratory materials, conducting laboratory exercises, and adapting class and laboratory work to each other.

SEMINAR IN AGRICULTURAL EDUCATION. Four hours. Two semester credits. Professor Holton.

This course is designed for superintendents, principals and college and high-school teachers of agriculture. It consists of lectures, reports and class discussions on topics of agricultural education. Each member of the seminar is expected to choose a topic early in the term for special investigation and to embody the results of the investigation in a paper. Prerequisites: Psychology and Educational Administration.

ENGLISH.

Professor MACARTHUR.
Associate Professor DAVIS.
Assistant Professor RICE.

ENGLISH LITERATURE FOR HIGH-SCHOOL TEACHERS. Six hours. Three semester credits. Professor Macarthur.

This course is intended especially for those teaching or desiring to teach English literature in the high shool. The class work consists not only of lectures by the instructor, the interpretation of the works assigned for study, and the writing of critical essays, but of systematic discussion of methods for presenting the classics to the pupils in the high school and of awakening in them a warm, vital appreciation of the best literature.

LITERATURE FROM THE READERS. Six hours. Three semester credits. Assistant Professor Rice.

This course is planned to meet the needs of teachers of rural and grade schools. The aim of the course is to stimulate the teacher's love for good literature until she becomes conscious of her power to interest, impress and inspire boys and girls. Reading is considered both as a fundamental means of acquiring knowledge and as a stepping-stone to the appreciation of the world's best literature. Special emphasis is placed upon teaching children how to study the reading lesson, and upon the necessity to use in the reading lessons more of the literature of rural life. One hour each week is devoted to special methods of teaching reading.

ENGLISH COMPOSITION FOR HIGH-SCHOOL TEACHERS. Six hours. Three semester credits. Associate Professor Davis.

This course aims to do for teachers of English composition in the high school what the preceding course does for the teachers of literature. Both courses consider particularly the needs of the teacher who has had special training in home economics, agriculture, manual training, or general science, but who has not had such training in English. A definite program of work for the high-school year is constructed and discussed. The best conduct of composition work under the conditions met in the rural and smaller high school receives special consideration.

101. COLLEGE RHETORIC I. Six hours. Three semester credits. Professor Macarthur.

This course consists of a rapid review of the principles of sentence structure, outlining, and paragraphing, followed by a study of the elements of effective writing in prose. In connection with the course systematic training is given in the writing of expository themes.

ENGLISH LITERATURE. Six hours. Three semester credits. Assistant Professor Rice.

This course consists of a general survey of English Literature. Lectures are given on the history of English literature from the earliest

times to the present day. In addition, works of representative authors of each period are assigned for reading outside of the classroom. These are discussed in class and passages from them interpreted.

122. BUSINESS ENGLISH. Six hours. Three semester credits. Associate Professor Davis.

This course comprises a thorough review of business letter-writing, exercises in writing contracts, notes, mortgages, wills, orders, sale bills, specifications, model story advertisements, and a practical study of other forms commonly used in connection with business.

ORAL ENGLISH FOR WAR WORKERS. Professor Macarthur.

The work of this course consists of a discussion of practical methods of presenting subjects orally. The material used will be drawn from topics related to the war. A survey will be made of the causes of the conflict and of the various means being employed in its prosecution. The work of the Red Cross, of the National Security League, and of other agencies will be considered. All of the foregoing material will be made the basis for class talks. Constructive criticisms will be given by the instructor.

ENTOMOLOGY.

Assistant Professor TANQUARY.
Assistant Professor MERRILL.

101. GENERAL ENTOMOLOGY. Class work, four hours; laboratory, six hours. Three semester credits. Prerequisites: General Zoölogy I and II, or equivalent. Assistant Professor Tanquary.

This is a study of the elementary anatomy and physiology of insects, complete enough to give a thorough understanding of the life history and habits of the most important species, and the general principles upon which the control of these economic forms is based. It is a study of the more important general facts about insects as a class; the main characters of the different orders and groups; how they become fitted to survive and multiply; and how the structure and habits of one group render it susceptible to certain measures of control, while in other groups entirely different measures are necessary. Field work forms a limited part of the course.

111. APICULTURE. Class work, four hours; laboratory, six hours. Three semester credits. Assistant Professor Merrill.

This course comprises a general study of the structure, life history, general behavior, activities and products of the honey-bee. Special attention is given to practical beekeeping, dealing with the best methods practical among beekeepers. A study is made of bee diseases and of the standard methods to be used in the eradication and control of them. A study is also made of the relation of bees to agriculture and horticulture.

HISTORY AND CIVICS.

Professor PRICE.
Associate Professor ILES.
Assistant Professor TAYLOR.
Assistant Professor JAMES.

101. AMERICAN HISTORY I (BEGINNINGS OF THE AMERICAN NATION). Six hours. Three semester credits. Professor Price.

This course gives special emphasis to the industrial phases of the origin and development of American nationality and democracy to the end of the War of 1812. It also includes our constitutional and political development, especially with reference to origin, basis, cause, and effect. It aims to develop historic-mindedness; that is, training the student to put himself in the other fellow's place and understand fairly "the why."

The European origin and background of American history, the evolution of colonial life, industries, and institutions; why we became an independent nation; our westward expansion; the establishing of nationality, and the development of government by the people, are phases definitely emphasized. Instruction is given by means of lectures, readings, and recitations.

202. American History II (Westward Expansion). Six hours. Three semester credits. Professor Price.

This course concerns itself with the industrial conditions, the issues and the leaders of the middle period of our history, from the War of 1812 to the Civil War. Among the subjects investigated are the industrial and political conditions in America in 1816; the Missouri compromise; the antislavery agitation; the Webster-Hayne debate; South Carolina nullification; annexation of Louisiana, Florida, and especially Texas; the Mexican War, and the resulting preponderance of the slavery issue; the compromise of 1850; the Kansas-Nebraska bill and the early Kansas struggle "to the stars through difficulties," including the various constitutions and the final admission to statehood; the origin of the Republican party; the election of 1860; secession and the Civil War.

This course and the one described above are both based on the American History Notebook, approved by the State School Book Commission, and includes a thorough consideration of the state texts, James and Sanford's American History, Foster's History of the United States, and Arnold's History of Kansas.

203. American History III (The New Industrial Age). Six hours. Three semester credits. Professor Price.

This course opens with a review of the industrial conditions in America just before the Civil War; next a careful examination is made of the industrial effects of that war; finally a study of the political and constitutional history of the last half-century is made in the light of the industrial conditions and developments of the same period. Manufactures, commerce, and especially agriculture, are carefully examined, particularly with reference to the South and West. The new developments in political parties and the new devices in self-government are studied as to developments, cause, and present conditions. The new America, with its spirit of nationality, its emphatic self-government, and its new world power and responsibility are studied especially in the light of the new industrial developments. Instruction is by lectures, recitations, assigned readings, and special reports.

204. American Agricultural History. Six hours. Three semester credits. Professor Price or Assistant Professor Taylor.

This course is intended primarily for those who wish to make a special study of the rural elements, questions, problems, and changing conditions in our national development. It starts with a study of European background and Indian beginnings. It traces and compares the agricultural development of New England, the South, and the central colonies during the colonial period; then follows the westward movement into the Mississippi valley, with the distinctive American developments in life and manners, and especially in the invention and use of machinery with its epoch-making results. The course gives special consideration to the South, with its cotton; to the Northwest, with its wheat; to the Southwest, with its livestock; and to the Corn Belt, with its varied industries. A special study is made of the last quarter century, when varied industries, more intensive farming and the high cost of living are replacing extensive mining of the soil, with its remarkable era of low cost of living, its rapid accumulation of wealth, and the resulting developments of civilization. The new South, the far West, and the relation of all this to our own state are interesting phases of the course. Instruction is given by lectures and recitations, readings and reports.

105. American Industrial History. Six hours. Three semester credits. Assistant Professor Taylor.

This course traces the history of American agriculture, manufactures and commerce with related activities from their colonial beginnings to the present. It includes a survey of the physical basis for American history, the growth of population and its expansion across the continent, and the reflection of these things on our industrial, social and political life. European developments, especially the industrial revolution and the expansion of commerce, are studied for the light they throw on American history. Finally, throughout the course an attempt is made to trace the growth of our national industrial organization and its present-day aspects. This course is based on Outlines of American Industrial History, prepared by the department. A text such as Coman's Industrial History of the United States or Bogart's Economic History of the United States is required, and the student is held responsible (*a*) for the contents of his text, and (*b*) for assigned library work and lectures.

121. English History. Six hours. Three semester credits. Assistant Professor Taylor.

A survey is made of the whole field of English history, with special emphasis on the modern period. The Tudor and Stuart regimes, with their bearings on constitutional and political advance and New World history, the growth and organization of the empire, the commercial and industrial revolutions, and more recent political, social and industrial developments, will be studied in as much detail as the time allows. Throughout, some notice will be taken of contemporary world history and of England's position in international affairs leading up to her part in the Great War. The course is based on Cheyney's Short History of England as a text, with lectures and assigned readings.

223. Modern Europe (Since 1814). Six hours. Three semester credits. Associate Professor Iles.

This course traces the evolution of modern European nations since 1814, with special attention to political organization, industrial development, and colonial expansion. Political problems and social and economic adjustments due to the Great War are included. A desirable course for all who wish a large view and clear understanding of the Europe that is now involved in war. Recitations, lectures and assigned readings. Text, Hayes's A Political and Social History of Modern Europe, vol. II.

Teachers' Course in History. Four hours. Two semester credits. Associate Professor Iles.

This is a seminar course of discussions based on Henry Johnson's Teaching of History in Elementary and Secondary Schools, together with Mace's revised work, Method in History, and supplemented by a study of the Report of the Committee of Seven, and of the Committee of Five on History in the Secondary Schools, and the Committee of Eight on History in the Elementary Schools. A critical examination is made of special books on method in history and civics, such as Wayland's How to Teach American History, and of special articles in the History Teachers' Magazine. The different texts in history and civics are critically investigated as to points of excellence or weakness, including lectures on the content or viewpoint of each. Information is also given as to the best illustrative material and helps in the teaching of history and civics. This course reveals the evolution in the writing of history, and the growing importance of history and civics in the modern school curriculum, together with the improving viewpoint as to content of both the history and the civic courses.

207. Pan-America. Four hours. Two semester credits. Assistant Professor James.

This course will deal, in some measure, with the European background of Spanish, Portuguese and Saxon America. In greater degree, it will comprise a careful study of the conquest, the native civilizations and the institutions and life of the colonial period. As regards Latin America and Canada, considerable stress will be placed upon present-day conditions, political, social, and economic, and upon the relations of these countries with the United States. The work of the course comprises a careful study of a text, supplemented by assigned readings, map work and lectures.

126. Current History. Two hours. One semester credit. Assistant Professor James.

The subject matter of this course varies each semester from that of any other semester. The student is guided in the study of this course by such weekly magazines as *The Independent* and *The Outlook*, supplemented by such monthly periodicals as *The Review of Reviews, World's Work, Current Literature*, etc. The course is designed to give the student as wide an outlook on contemporary world movements and as good an understanding of the conditions and institutions in the midst of which he lives as can be crowded into two recitation periods per week. At the same time it directs the student to good habits of news reading of the right sort.

American Nation I. Six hours. Four semester credits in the School of Agriculture, or the first half-unit of American History for college entrance. Assistant Professor James.

This course comprises a survey of American history from the discovery of America to the overthrow of the Federalist party in 1800. It deals with the establishment of the English colonies in America, the growth of social and political institutions in these colonies, the development of an American nationality, the struggle among European nations for possession of North America, the divergent English and American political theories, the causes and meaning of the American Revolution, the schemes for financing the Revolutionary war, the European diplomatic entanglements, the relations of the Continental Congress and the states, the efforts to solve the problem of imperial organization, the Constitutional Convention, and the Federalist organization of the new government. Along with the political history of this period goes a study of America's economic development to 1800. Texts: West's American History and Government, and Bogart's The Economic History of the United States.

Modern History II. Six hours. Four semester credits in the School of Agriculture, or the last half-unit of Modern History for college entrance. Assistant Professor James.

This course is designed to set forth the history of Europe since the Thirty Years' War. The rise of Prussia and of Russia, the decline of Spain, the ascendancy of France, the great Revolution, the Napoleonic empire, are the chief subjects for study during the early part of the course. The latter part is given over to a study of the growth of nationalities in the nineteenth century, special attention being directed toward the social, political and economic developments of the period, as well as to the international relations, all with the object of making clear in some degree the causes operating to bring about the present Great World War. The text used will be Harding's New Medieval and Modern History, together with Robinson and Beard's Outlines of European History, Part II, and assigned readings.

151. American Government. Six hours. Three semester credits. Associate Professor Iles.

This course in civics, or actual government, reviews definitely the fundamental principles and operations of our state and national governments, including the essential principles of constitutional law, but gives special emphasis to the actual present-day conditions and movements in our governmental and political life. Among the subjects especially studied are the initiative and referendum, suffrage and primary elections, the recall, city government and government of territories, the regulation of commerce, conservation of national resources, national defense, taxation and finance, the actual methods of congressional activity, and the function, organization, power, and importance of political parties in our government. The course is primarily based on Beard's American Government and Politics. Throughout this course special and definite attention is given to recent and current events in governmental activities.

Civics. Six hours. Four semester credits in the School of Agriculture, or one-half unit for college entrance. Assistant Professor James.

This course, while designed primarily to meet the needs of teachers of civics in grammar schools and in high schools and of those preparing for college, is intended generally as a preparation for the duties of citizenship. Therefore, the emphasis is laid upon the actual workings of American government, with due attention to recent changes and tendencies in state and nation. The text used is Guitteau's Government and Politics in the United States, Kansas edition, supplemented by assigned readings.

INDUSTRIAL JOURNALISM AND PRINTING.

Professor Crawford.
Instructor Keith.

107. Elementary Journalism. Four hours. Two semester credits. This course should be accompanied by Journalism Practice I to give four credits. Professor Crawford.

This course is designed to give the students practical experience in the fundamentals of newspaper work. It is intended to prepare for more advanced courses in journalism or to give necessary training for effective use of the written article in farm bureau, educational, and other vocational activities. Methods of obtaining news of various types, the writing of the lead, and the general style of the news story are carefully considered. The duties of the reporter and the physical, mental and ethical demands made upon him are briefly presented. Attention is given to the history and scope of journalism. In the Summer School, this course takes up also the teaching of news writing in the high school.

110. Journalism Practice I. Eight hours. Two semester credits. Professor Crawford.

This course embodies actual practice in journalism, as closely approximated as possible to actual newspaper work. Students are required to gather news, both assigned and unassigned, and to write the stories in the department work room. The College campus is divided into "runs" which the students cover at regular intervals, and assignments are given at specific times as in a newspaper office. The work is adapted to the needs and qualifications of each student.

Current Periodicals. Four hours. Two semester credits. Professor Crawford.

The course comprises a study of current periodicals of various types. Special emphasis is laid on the material that they contain and the nature of its appeal to the reader. It is a nontechnical course, intended to give general students or teachers some knowledge of the field of current periodical literature.

PRINTING PRACTICE. Eight hours. Two semester credits. Instructor Keith.

A study of composition of general printing-shop practice, including cost finding, is made in this course. The work is adapted to the needs of those taking it, but is intended particularly for high-school teachers of printing and for those who expect to have editorial supervision of publications, including high-school papers. Lectures are given on such subjects as the history of printing, artistic typographical arrangement, and the use of printing as an aid in the study of spelling, punctuation, and English composition. More advanced work will be given to students prepared for it.

MATHEMATICS.

Associate Professor WHITE.
Assistant Professor STRATTON.
Instructor FEHN.

ALGEBRA I AND II. Seven and a half hours. Four semester credits. Assistant Professor Stratton.

A review course over the usual topics presented in the first year's work in algebra. Treatment is given of linear equations, factoring, fractions, graphs, simultaneous linear equations, involution, evolution, theory of exponents, radicals, quadratic equations, with application to practical problems. Text, Wells and Hart's New High-School Algebra.

PLANE GEOMETRY I AND II. Seven and a half hours. Four semester credits. Mr. Fehn.

The material here studied comprises the principal theorems and constructions of the first year's course in elementary geometry. Problems and original exercises are given an important place. Text, Wentworth and Smith's Plane and Solid Geometry.

SOLID GEOMETRY. Seven and a half hours. Four semester credits. Associate Professor White.

This course comprises the usual theorems and constructions, including the relation of planes and lines in space; the properties and measurements of prisms, cylinders, pyramids, and cones; the sphere and spherical triangle. The solution of many numerical and original exercises is required and mensuration of surfaces and solids is treated. Text, Wentworth and Smith's Plane and Solid Geometry.

PLANE TRIGONOMETRY. Six hours. Three semester credits. Mr. Fehn.

Measurement of angles, functions of any angle, functions of multiple and submultiple angles, sum and difference formulæ are included in this course. Triangles and trigonometric equations are solved. Text, Palmer and Leigh's Plane and Spherical Trigonometry.

ANALYTICAL GEOMETRY. Seven and a half hours. Four semester credits. Assistant Professor Stratton.

Coördinate systems and applications; loci; the straight line, circle, parabola, ellipse, and hyperbola are studied in this course. The subject matter is that of the usual first course. Text, Bailey and Wood's Plane and Solid Analytical Geometry.

CALCULUS II. Six hours. Three semester credits. Associate Professor White.

The subject matter of this course belongs in the main to integral calculus. Emphasis is laid upon the applied side. Problems involving areas, lengths, surfaces, and volumes are treated by methods of single integration. The idea of successive and partial integration is applied to areas, moments, centers of gravity, surfaces, volumes, etc. The types of

differential equations which the student of engineering is most likely to meet with in his subsequent work are briefly discussed. Text, Phillip's Differential and Integral Calculus.

TEACHERS' COURSE IN HIGH-SCHOOL MATHEMATICS. Two hours. One semester credit. Associate Professor White.

This course undertakes an examination of the subject matter and methodology of high-school mathematics. It includes a study of high-school needs and of high-school courses in algebra, geometry and trigonometry, with bibliographies and other sources of assistance in teaching high-school mathematics. The course includes also a study of the mathematical situation of the past decade as regards the high-school, with present outlook, problems, and purposes. The work proceeds by readings, lectures, and reports. The student should have as a basis of his work Young's The Teaching of Mathematics.

TEACHERS' COURSE IN ARITHMETIC. Two hours. One semester credit. Assistant Professor Stratton.

This is a course for rural and grade teachers and those interested in the applications of arithmetic to the everyday problems of the farm, shop, and home. Special attention is given to a study of the sources and the preparation of supplementary problems for schools. Some attention is given to the history, recent studies and advancements, and approved methods of presenting the subject. Texts, Stratton and Remick's Agricultural Arithmetic, and Brown and Coffman's How to Teach Arithmetic.

MODERN LANGUAGES.

GERMAN.

Professor CORTELYOU.

101. GERMAN I. Six hours. Three semester credits.

After two periods given to the acquisition of the sounds of the German letters, the student at once begins reading. Vocabularies are learned from the outset, while grammar is acquired gradually through reading. Oral and written work and simple conversational exercises begin with the first reading lesson. In the work of this term there is included the study of articles, declensions of nouns and pronouns, the indicative mode of weak verbs, sentence order, and the comparison of adjectives. Frequent reviews enable the student to digest the facts presented, while the abundant conversation and written work subserves the same end. Text: Vos's Essentials of German (first eighteen lessons).

106. GERMAN II. Six hours. Three semester credits.

The remaining important points of grammar are studied. Students are repeatedly drilled on the grammatical constructions already emphasized in Elementary German I. The general plan of the work is the same as in the preceding term. Essential facts of grammar are insisted upon, but German is taught as a living language. Conversational exercises in German and written translation from English into German are frequent. Text: Vos's Essentials of German (completed).

111. GERMAN READINGS. Six hours. Three semester credits.

This course embraces readings of dialogue selections which deal in detail with German life, customs, history, and mythology. A few of the best and most popular song poems also are studied. Grammatical drill is continued, with occasional sight readings and translations into German. Conversations are based on the readings. The student learns to read and write German script. Text: Bacon's Im Vaterland.

206. GERMAN COMEDIES. Six hours. Three semester credits.

The course comprises the reading of recent one-act comedies of literary merit, and of a realistic, lively and cleanly humorous nature, including the following: Julius Rosen's Ein Knopf, Gustav von Moser's Ein amerikanisches Duell, Hugo Mueller's Im Wartesalon erster Klasse, and Emil Pohl's Die Schulreiterin. Exercises in conversation and sight reading are occasionally introduced. Text, Manley and Allen's Four German Comedies.

SPANISH.

Instructor LIMPER.

176. SPANISH I. Six hours. Three semester credits.

Because of the practical value of Spanish, particular attention is paid from the very beginning to the spoken language. The vocabulary used consists of words and phrases employed in everyday life. Much drill is given on verb forms. At the end of this course the student should be able not only to express his thoughts in simple Spanish, but also to read newspaper articles and to carry on ordinary correspondence with the assistance of a dictionary. A number of lessons are devoted to business forms. Text, Coester's A Spanish Grammar (Part I).

FRENCH.

Instructor LIMPER.

151. FRENCH I. Six hours. Three semesters credits.

The phonetic symbols being a great help in the acquisition of accurate pronunciation, the first two days are devoted to learning these symbols and a number of useful expressions in French. The recitations are conducted largely in French and considerable time is devoted to conversation. Nevertheless, conversation is considered merely a means to the acquisition of a reading knowledge of French. The fundamentals of Grammar are covered in this semester and reading matter in the grammar is supplemented by a reader. Text: Olmsted's Elementary French Grammar (first twenty-two lessons) and Allen and Schoell's French Life (thirty pages).

156. FRENCH II. Six hours. Three semester credits.

This course is a continuation of French I. The grammar is completed, special attention being given to irregular verbs. Reading and conversation are continued throughout the course. Students who have had one year of French in high school begin with this course. Texts: Olmsted's Elementary French Grammar (Lesson XXII to the end) and Allen and Schoell's French Life.

161. FRENCH READINGS. Six hours. Three semester credits.

This is essentially a reading course, the purpose being to enlarge the student's vocabulary. Grammar is reviewed and considerable time is devoted to conversation. Fontaine's En France and one other short French text are read.

MILITARY FRENCH. Three hours a week. No outside preparation. No credit. Mr. Limper.

In this course the maxim "We learn to speak by speaking" is kept in mind. Only the most essential points of French grammar are dwelt upon. A vocabulary of several hundred words pertaining to military life is mastered. Much drill is given on the present and past tenses of the most common verbs. Training the ear to understand spoken French receives particular attention. Text: First Lessons in Spoken French for Men in Military Service, by Wilson, Coleman and Huse.

MILITARY TRAINING.

Captain O'NEILL.
Assistant Professor WENDT.

Classes in military training will be formed, the hours to be arranged.

MUSIC.*

Professor WESTBROOK.
Associate Professor BROWN.
Instructor JOHNSTON.
Instructor ABERNETHY.

PUBLIC-SCHOOL MUSIC. Four hours. Two credits. Professor Wesbrook, Associate Professor Brown.

This course is a general survey of music in public schools from the primary grades through the high school. Methods of presenting music to children in the different stages of development are taught and materials for such work are studied. Suggestions for community music work are also given.

VOICE. Private instruction. Professor Wesbrook and Instructor Johnston.

Hours to suit the convenience of students are arranged for those wishing private vocal instruction. For two half-hour private lessons a week one credit is given.

VIOLIN. Private instruction. Associate Professor Brown.

This work is organized after the same plan as vocal instruction. Credit of one hour is given for private instruction.

PIANO. Private instruction. Instructor Abernethy.

This work is organized the same as Voice and Violin and a special piano teacher is in charge.

HARMONY. Four hours. Two semester credits. Associate Professor Brown.

The course in harmony includes the study of scales and intervals, primary and secondary chords and their inversions, harmonizing given bases and melodies, ear training, the chord of the dominant seventh, and keyboard harmony. Students contemplating teaching music in public schools will find this work invaluable to them, as it is the grammar and mathematics of music. At least five must enroll for harmony or the class will not be organized.

MUSICAL HISTORY. Two hours. One semester credit. Associate Professor Brown.

A brief survey of the primitive development of the art is given, together with special attention to the classical and romantic periods and present-day conditions and tendencies. The work is made especially interesting by use of copious illustrations on the phonograph.

CHORUS. Two hours. Twice a week, one hour periods. One semester credit. Professor Westbrook.

Every student enrolled in the Summer School is urged to sing in the chorus. This work will be the study and public presentation of beautiful choruses.

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* The following fees are charged for private instruction in music:

Two half-hour voice lessons per week throughout the term, with Director Westbrook	$16.50
Same, with Instructor Johnston	11.00
Violin or band instruments, with Associate Professor Brown	11.00
Piano, with Miss Abernethy	11.00

The fees named are just one-half of the regular College semester fees.

ORCHESTRA. Two hours. One semester credit. Associate Professor Brown.

Every individual who plays an orchestral instrument is urged to bring that instrument and play in the Summer School Orchestra. High-grade orchestra music is studied and is presented in public performances.

PHYSICS.

Professor HAMILTON.
Assistant Professor FLOYD.
Instructor SMITH.

GENERAL SCIENCE. Six hours. Three semester credits for admission; no college credit is given. Assistant Professor Floyd.

This course is intended for those teachers who are required to offer courses in general science in public-school work. The course includes class, laboratory and field work. It is based on such everyday problems as: Water supply, air supply, weather predictions, light supply, prime motors, transportation, crops, and similar problems, with a study of what science in general has done and can do to solve them. Text to be selected.

INTRODUCTORY PHYSICS. Class work, four hours; laboratory, six hours. Three semester credits for admission; no college credit given. Instructor Smith.

This course is designed for those teachers who desire some knowledge of elementary physics and yet have not time to take the three regular courses offered in this subject. The entire subject is covered and some time given to working problems. Simple experiments and demonstrations are given. The course is a good review for those who have had high-school physics. Students who expect to take county examinations for certificates to teach are advised to take this course. Text, Black and Davis's physics.

ELEMENTARY PHYSICS I. (H-I, M-I, A-I.) Class work, four hours; laboratory, four hours. Three semester credits in the School of Agriculture. Prerequisite: Algebra III. Assistant Professor Floyd.

This course is intended to give a general view of mechanics, sound and heat. Special emphasis is placed upon principles which will be met again in later work in the same or other sciences. Text, Black and Davis's Physics.

ELEMENTARY PHYSICS II. (H-II, M-II, A-II.) Class work, four hours; laboratory, six hours. Three semester credits in the School of Agriculture. Prerequisite: Elementary Physics I. Instructor Smith.

This is a continuation of Elementary Physics I and includes a study of light, magnetism and electricity. The fundamental laws are studied and illustrated and the working principles of many electrical appliances in daily use are made the subject of class discussion.

TEACHERS' COURSE IN PHYSICS. Class work, four hours; laboratory and library, four hours. Three semester credits. Assistant Professor Floyd.

The course includes a study of the modern texts, manuals and methods in high-school physics. Students are given an opportunity to help assemble apparatus and to assist in lecture demonstrations, such as lantern, X-ray, manipulation of generator and motor, induction coils, storage cells, spectroscope, nickel-plating, etc. The laboratory includes the usual experiments required in the elementary course in physics. The purpose of the course is to discuss methods best adapted to the presentation of those topics which present special difficulty, to advise methods of illus-

trating and demonstrating the fundamental principles, and to select from a large number of possible laboratory experiments a list which might be used in any of our high schools of Kansas. This course is intended for those who are either teaching or expecting to teach physics in secondary schools.

HOUSEHOLD PHYSICS. Six hours. Three semester credits. Professor Hamilton.

This is a course of lectures and demonstrations, in which the laws relating to principles involved in appliances of the household are explained and illustrated. The work in heat is based upon thermometry, calorimetry, radiation, absorption, and methods of refrigeration and ventilation. The course includes a study of light with its color phenomena and actinic effects; of some of the optical instruments used in scientific work; a study of electric lighting and illumination, and of the home, including suggestions for the proper use and care of electrical apparatus for the protection of the appliances and of the operator.

COLLEGE PHYSICS. (Engineering Physics II or General Physics II.) Class work, six hours; laboratory, six hours. Five semester credits. Professor Hamilton.

This is an advanced course in electricity and light. It is the same as is required of all engineering and general science students, and gives the student a working knowledge of the units employed in measuring current and of various methods of producing current, and acquaints him with the electrical appliances used in both current production and electrical measurements. The laboratory work includes the work with generators and motors, photometers, lamp tests, spectrometers, and advanced problems in both electrical measurements and light. Text, Kimball's College Physics.

COLLEGE PHYSICS. (Engineering Physics III or General Physics III.) Class work, ten hours; laboratory, six hours. Five semester credits. Professor Hamilton.

This course is required of all engineering and all general science students. The class work is a continuation of the course in electricity and includes a thorough study of light and heat phenomena. The laboratory work includes many heat and light measurements and the use of accurate instruments for such measurements. Text, Kimball's College Physics.

PHOTOGRAPHY. Class work, two hours; laboratory, six hours. Two semester credits. Professor Hamilton.

The importance of a record of exact details, as shown in photography, makes this work valuable to all scientists. The course gives the student some knowledge of chemical and physical principles involved in the art, as well as practice in making good negatives and prints. The lecture and laboratory work deals with: things to be considered in selecting a camera; proper exposures; composition of pictures; proper development of plates; tests of different developers; retouching; reducing and intensifying negatives; printing and mounting; making lantern slides, bromide enlargements, and the prints best adapted for illustrated articles in newspapers and magazines.

PUBLIC SPEAKING.

Professor BURNS.

EXTEMPORE SPEECH I. Four hours. Two semester credits.

The work of this course consists in the preparation and delivery of short addresses based on prepared outlines. Careful preparation of material is required. The plan of the speech is made in advance, but the choice of language is left for the moment of speaking. Criticisms

and points of theory, given by the instructor, supplement the practice work. Conviction, not entertainment, is the dominant purpose in the course.

DRAMATICS. Four hours. Two semester credits.

This is not an elaborate study of the drama, but aims to give instruction in dramatic presentation. Practice work predominates. Special attention is paid to "home talent" or amateur theatricals, and methods of coaching are suggested. The "Little Country Theater" idea is developed.

ADVANCED PUBLIC SPEAKING. Two hours. One semester credit.

In this course the work consists of the preparation and delivery by the student of one extended lecture-recital, lecture, or address during the term. This is supplemented by class lectures and practice, and by a study of types. It may include the preparation and delivery of institute talks or of addresses suitable for extension work.

PUBLIC SPEAKING FOR TEACHERS.

This course is designed, first, to give the teacher training in the art of reading and speaking from the public platfrom; second, to give the teacher a knowledge of the principles of public speaking as they apply to pedagogy. Practice work predominates. The situation in the grades and high schools is covered. Special emphasis is placed upon the teaching of reading in the schools.

SUMMER SCHOOL PLAY.

The department prepares and presents during the session one amateur play. The Summer School plays are of a standard type, good royalties being paid to secure them. Any student enrolled in the Summer School is eligible to try out for the cast.

ZOÖLOGY.

Doctor ACKERT.

I. ZOÖLOGY FOR TEACHERS. Class work, three hours; laboratory, twelve hours. Three semester credits. No prerequisites. This course may be substituted for Economic Zoölogy, upon completing enough work to meet the approval of the instructor.

This course consists largely of early forenoon field trips to the various meadows, woods, ponds, and streams in the vicinity of Manhattan. It is a combination of the study of animals in their habitats in relation to each other, to plant life, and to man, and of methods of conducting field trips with children and high-school students. Collections of live forms are made during the trips, and these are studied in more detail in the aquaria and cages in the laboratory. Special study is made of methods of keeping animals alive in aquaria and cages for further observation of habits and forms. Several children are selected from the grade schools and allowed to make a number of the trips and to participate in the studies in the field and laboratory and in the arrangement of the aquaria and cages.

II. ZOÖLOGICAL PROBLEMS. Elective for undergraduates. One or two semester credits. Prerequisites, consult instructor.

Individual problems in heredity, parasitology, cytology and embryology, and animal behavior are assigned by the instructor with whom the work is done.

III. RESEARCH IN ZOÖLOGY. Elective for graduates. Prerequisite, consult instructor.

Individual research problems in heredity and experimental evolution, parasitology, cytology and embryology, and animal behavior are assigned.

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SPECIAL WAR SESSION

KANSAS STATE AGRICULTURAL COLLEGE

May 31 - August 2
1918

A real opportunity for the teachers of Kansas

THE SITUATION

There are in the high schools of Kansas:

474 teachers of Agriculture
341 teachers of Home Economics
244 teachers of Shop Work
769 teachers of Sciences

A large per cent of the men teacher of these subjects have answered the call of our country, some to the trenches, others to special war emergency work. Many of the teachers of Home Economics have gone into Red Cross work, others into other lines of war service.

The production and conservation of food is a necessity. The work shops must be kept busy. The Red Cross must have trained workers. The departments of Agriculture, Shop Work, Home Economics, and Sciences in our high schools must be filled with trained teachers.

The War Session of Kansas State Agricultur
a chance for greatly increased service and th

HOW TO MEET IT

The Kansas State Agricultural College, upon the request of the Federal Government, will put on a "Special War Session," May 31 to August 2, 1918.

Special war emergency courses will be offered in:

Crop Production
Live Stock Production
Destruction of Insects and Pests
Dairying
Farm Tractors
Wireless Telegraphy
War Industries
Fuel Conservation
Food Conservation
Scientific Management
Red Cross Work
Stenography and Typewriting
Many other essential lines of work

Special courses in Agriculture and Shop Work for women will be one of the features. The courses will prepare women teachers to take the places of men who have gone to the trenches.

College offers two things to Kansas teachers:
rtainty of rapid advancement in that service.

In addition to the war emergency courses there will be offered regular college courses in:

Agriculture	English
Mechanic Arts	Entomology
Domestic Science	Modern Languages
Domestic Art	History
Home Art	Civics
Physical Education	Journalism
Bacteriology	Mathematics
Botany	Music
Chemistry	Printing
Economics	Public Speaking
Education	Zoology

Write for special announcement. BETTER STILL, write a letter telling just what work you want.

Dean of Summer School

KANSAS STATE AGRICULTURAL COLLEGE

Manhattan, Kansas

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Dean of Summer School

KANSAS STATE AGRICULTURAL COLLEGE

Manhattan, Kansas

Training That Will Help You Serve Your Country

In Government Positions
In Teaching
In Business
In the Home

Summer Session
May 31 to August 2, 1918
Kansas State Agricultural College
Manhattan, Kansas

INDUSTRIAL JOURNALISM

Every teacher of English meets the problem of making the work more practical. Actual writing for papers is a sure means of accomplishing this end.

Every teacher, too, meets the problem of helping students choose the best in the current magazines.

These two problems are to be met in the work in Industrial Journalism in the Summer Session. Courses in Elementary Journalism and Journalism Practice will give the essentials of good news writing. A course in Current Periodicals will deal in a practical, interesting way with the important American magazines.

Both will be adapted to the needs of teachers, but will be of value also for cultural purposes and for training men and women who plan to do writing.

Some of the matters that will be taken up are the following:

Getting News	The Best Newspapers
Writing News	The Best Magazines
Newspaper Style	The High School Newspaper
Agricultural News	The High School Magazine
Household News	Community Publicity
	Wartime Publicity

PRINTING

The work in printing is intended to appeal chiefly to teachers of printing in high schools and to young printers on country newspapers who wish to spend a few weeks getting new ideas of general typography, press work, stock work, and office management.

The call to the colors has taken large numbers from the printing business and as a consequence there is a greater demand than ever before for *good* printers, both in the teaching and in the commercial field.

Printing in the high schools is rapidly becoming one of the most important manual training subjects offered and because of the scarcity of men capable of teaching this subject the salaries offered are very attractive.

The work in the summer school is arranged to fit the needs of each individual student. Following is a list of the lines that may be taken up:

History of Printing
Principles of Design
Straight Composition
Advertisement Composition
Job Composition
Press Work
Mixing Inks
Printing Plates
Buying and Handling Stock
Cost Systems

COMMERCE

Commercial courses are introduced into the Summer Session to prepare students to pass examinations for government positions and to fit them to fill places in the business world. An intensive course in commercial subjects will be given for the nine weeks of the session under the direction of Prof. D. L. Burk, who has had wide business experience and who previous to coming to Kansas won a stenographic championship.

The following courses are offered:

Shorthand. Class work and recitation, ten hours. Three semester credits.

The Gregg system of shorthand will be used. A standard of 100 words per minute must be attained in order to complete the course satisfactorily.

Typewriting. Class work and practice, ten hours. Three semester credits.

The touch method of typewriting will be taught, and systematic and progressive exercises will be given to develop speed and accuracy. A large part of the work will be devoted to transcribing letters dictated in the course in shorthand. The use of the tabular keys, cutting stencils, mimeographing, and the use of the adding machine will also be taught.

Office Organization and Management. Class work and recitation, three hours. One semester credit.

The principles of business organization and the various duties of a stenographer and of a secretary will be studied. Instruction will be given in modern office filing and record keeping. A limited amount of practice in bookkeeping will be included.

Commercial Law. Lectures, class work, and recitation, three hours. One semester credit.

A textbook in commercial law will be studied and the relations between law and business transactions will be discussed. This course will be given for those who plan to enter commercial pursuits rather than government service, and for others who may be interested in the study of business,

ence in methods of teaching history as practiced in the best schools of the country.

One of the newest, most promising and most interesting fields of study is that of "Pan-America." This includes Canada, Mexico, and especially the South American republics—their history and government, our relations with them, and their commercial opportunities. Here will be the world's greatest "opportunity" after the war is over. An excellent brief course in this subject will be offered here this summer by Professor James, who for some time has been specializing in this field.

The general course in English History offered by Professor Taylor will make both European and American history more clear and interesting. This course is strongly commended to any teacher of history for its value as side-light or as foundation for other courses in history or in literature.

This Special War Session will also offer courses in Business Law, Stenography and Typewriting, as well as courses in Economics and Sociology.

In short, this Special War Session is your opportunity.

For detailed announcements of the whole session, including Red Cross work, address

DEAN OF THE SUMMER SCHOOL,
KANSAS STATE AGRICULTURAL COLLEGE,
MANHATTAN, KANSAS.

SPECIAL WAR SESSION

A REAL OPPORTUNITY
FOR TEACHERS OF HISTORY AND CIVICS
IN KANSAS SCHOOLS

KANSAS STATE
AGRICULTURAL
COLLEGE

May 31 - August 2
1918

Read the Information
Contained in the Following Pages.
You Should Know of Your Opportunity
as There Explained.

Opportunity for Kansas Teachers

Of History and Civics

At the Special War Session of the
Kansas State Agricultural College

Prof. Ralph R. Price, author of the American History Note Book that has been approved by the State Text Book Commission for use in the high schools of Kansas, will offer three courses in American History, each for college credit, as follows: "Beginnings of the American Nation" (through the War of 1812), "Westward Expansion"(1816-1860), and "The New Industrial Age" (beginning with our Civil War and coming down to our World War). This last course will be especially helpful and interesting, partly because of its new view of the Civil War, partly because of its insight into the new democracy, largely because it covers just that part of our American History that is most difficult to teach as well as unfortunately least known, and especially because of the clear light that it throws on "the ever growing participation of the United States in world politics," leading to our part in the present war. Professor Price is also one of the editors of our State text in United States History as well as one of the editors of our State text in Kansas History, and the course in "Westward Expansion" which he will offer here this summer will be especially helpful for those who would know our Kansas history in a masterly fashion. His course in "The Beginnings of American Nationality" inspires because of its new view point.

Prof. Elden V. James will also offer a course in the first half of the high school, or college entrance, course in American History.

All of the courses in History offered here emphasize the new social and industrial viewpoint. Stressing this phase, Prof. Raymond G. Taylor will offer two special college credit courses, each covering the whole period of American history but limited to a single field, namely a course in "American Industrial History" and a course in "American Agricultural History." All who understand the new spirit of history as well as all who may be especially interested in this particular phase of our national history will at once recognize the opportunity here open to them.

Prof. I. Victor Iles, the author of the Kansas portion of our State text in Civics, will offer a college credit course in "American Government." Professor James will also offer a high school, or college entrance, course in "Civics." Each of these courses will emphasize the actual operations and the practical workings of our government, including the vital part played by our political parties, including also the essentials of community civics.

Everybody now wishes to know as much as possible about recent European history, the governments of the European nations, their interrelations, and their rivalries. To those who wish to understand the real significance of the World War in which we are now involved, a real opportunity is offered here this session by Professor Iles in his college course in "Modern Europe," which is limited to a study of the last hundred years.

Modern History will now doubtlessly become a required course in many high schools. It should be a popular course in all schools where the teacher is fully prepared. Realizing this fact, Professor James is in this session offering a course in the last half of this subject. The two State texts will be used and compared. Here and now is your opportunity to prepare to meet this new opportunity.

The high schools of the nation are rapidly introducing courses in "Current History." Every school should have such a course next year. Professor James will offer his regular course in "Current History" here this summer. This is one course that everybody should take.

Every teacher who wishes to improve her efficiency will be interested in the "Teachers' Course in History" offered by Professor Iles here this summer. Professor Iles is not only a graduate of the Eastern Illinois State Normal School and of the University of Kansas, but has also spent at least a year in each of the following institutions: the University of Colorado, the University of Wisconsin, the University of Pennsylvania, Princeton University, and Yale University. Thus he brings to this course a rich experi-

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